What is claimed is:

1. A method for assigning identifiers in a distributed system, comprising:

(a) establishing a circle as a locus of all identifiers, with the value of any point on the circle being the portion of one complete revolution in a first direction around the circle to the point, measured from a first zero point; and

(b) selecting values to be assigned as identifiers as needed by rounds of assignment, wherein the beginning and end of any round of assignment has identifiers assigned with point values that divide the circle into equal-length sectors.

2. The method of claim 1 wherein, in any round of assignment, beginning with n equal-length sectors, termed long sectors, only the value of midpoints of long sectors are selected as identifiers to be assigned in the system, creating with each new assignment two new short sectors, the round continuing until all long sectors are divided making the number of sectors at the end of the round, and the beginning of the next round 2n.

3. The method of claim 2 wherein in every ascending new round of execution the short sectors at the end of the previous round are considered to be long sectors at the beginning of the next round, the number of sectors increasing in each round by a factor of two.

4. The method of claim 2 wherein identifiers may be withdrawn arbitrarily in any round as well as assigned, and if an identifier withdrawn is an endpoint of an undivided long sector, an already-assigned identifier in that round having a value of a midpoint of a long sector is reassigned using the value of the withdrawn identifier, freeing the previous midpoint value to be reused.

5. The method of claim 4 wherein if in any instant round withdrawal of an identifier will reduce the number of sectors below the beginning number of

sectors for the round, a new descending round is entered wherein the long sectors of the instant round are considered short sectors of the descending round.

6. The method of claim 5 wherein a bitmap convention is used in any round for identifying, at any point in time, which long sectors are divided into short sectors by assignment of identifiers, and which are not, the number of bits in the main bitmap equal to the number of long sectors in the round.

7. The method of claim 6 wherein the main bitmap is divided into equal-length fragments, each fragment representing a group of adjacent sectors of the circle.

8. The method of claim 7 wherein the segment length is a power of two.

9. The method of claim 6 wherein the main bitmap is consulted in selecting sectors for assigning and reassigning identifiers.

10. The method of claim 7 wherein a hierarchy of bitmap fragments is established over the main bitmap, one bit in each upper-level bitmap representing a bitmap fragment in the next lower-level bitmap, wherein a one in a bit of an upper-level bit indicates either presence of at least one undivided sector or at least one divided sector represented in the associated lower-level fragment.

11. The method of claim 10 wherein the hierarchy of bitmaps is used to select sectors to divide to provide values for assignment as identifiers or assigned values to be re-assigned.

12. A method for selecting a bit of a main bitmap for an operation, comprising:

(a) dividing the bitmap into a series of fragments; and

(b) creating a first hierarchy of bit-map fragments in ascending levels, wherein each bit in a higher-level bitmap is associated with a multi-bit fragment

of a lower-level bitmap, and wherein a one in a bit of a higher-level bitmap indicates at least one value of one in the associated lower-level fragment.

13. The method of claim 12 further comprising a second hierarchy of bitmap fragments in ascending levels, wherein each bit in a higher-level bitmap is associated with a multi-bit fragment of a lower-level bitmap, and wherein a one in a bit of a higher-level bitmap indicates at least one value of zero in the associated lower-level fragment.

14. The method of claim 12 wherein bits of the main bitmap represent sectors of a circle, and the circle is the locus of all points having values to be assigned as indentifiers in a distributed system.

15. The method o claim 13 wherein bits of the main bitmap represent sectors of a circle, and the circle is the locus of all points to be assigned as indentifiers in a distributed system, and wherein a system managing assignment of identifiers in a distributed system enters one of the first and second hierarchies at the highest level, and follows bit indicators through the hierarchy to select a bit in the main bitmap indicating availability of an identifier to be assigned or re-assigned in the distributed system.

16. The method of claim 15 wherein the distributed system is a serverless telephony system comprising computerized appliances as nodes in the distributed network.

17. The method of claim 16 wherein one or both of fragments of the main bitmap and portions of the system managing assignment of identifiers are stored and operable on individual ones of active nodes in the serverless system.

18. A distributed, serverless system comprising:

a plurality of computerized appliances as active and inactive nodes in the serverless system;

a communication facility interconnecting individual ones of the plurality of computerized appliances; and

an assignment system for assigning and re-assigning identifiers to nodes of the serverless system;

wherein the assignment system establishes a circle as a locus of all identifiers, with the value of any point on the circle being the portion of one complete revolution in a first direction around the circle to the point, measured from a first zero point, and selects values to be assigned as identifiers as needed by rounds of assignment, wherein the beginning and end of any round of assignment has identifiers assigned with point values that divide the circle into equal-length sectors.

19. The distributed system of claim 18 wherein, in any round of assignment, beginning with n equal-length sectors, termed long sectors, only the value of midpoints of long sectors are selected as identifiers to be assigned in the system, creating with each new assignment two new short sectors, the round continuing until all long sectors are divided making the number of sectors at the end of the round, and the beginning of the next round 2n.

20. The distributed system of claim 19 wherein in every ascending new round of execution the short sectors at the end of the previous round are considered to be long sectors at the beginning of the next round, the number of sectors increasing in each round by a factor of two.

21. The distributed system of claim 19 wherein identifiers may be withdrawn arbitrarily in any round as well as assigned, and if an identifier withdrawn is an endpoint of an undivided long sector, an already-assigned identifier in that round having a value of a midpoint of a long sector is reassigned using the value of the withdrawn identifier, freeing the previous midpoint value to be reused.

22. The distributed system of claim 21 wherein if in any instant round withdrawal of an identifier will reduce the number of sectors below the beginning number of sectors for the round, a new descending round is entered wherein the long sectors of the instant round are considered short sectors of the descending round.

23. The distributed system of claim 22 wherein a bitmap convention is used in any round for identifying, at any point in time, which long sectors are divided into short sectors by assignment of identifiers, and which are not, the number of bits in the main bitmap equal to the number of long sectors in the round.

24. The distributed system of claim 23 wherein the main bitmap is divided into equal-length fragments, each fragment representing a group of adjacent sectors of the circle.

25. The distributed system of claim 24 wherein the segment length is a power of two.

26. The distributed system of claim 23 wherein the main bitmap is consulted in selecting sectors for assigning and reassigning identifiers.

27. The method of claim 24 wherein a hierarchy of bitmap fragments is established over the main bitmap, one bit in each upper-level bitmap representing a bitmap fragment in the next lower-level bitmap, wherein a one in a bit of an upper-level bit indicates either presence of at least one undivided sector or at least one divided sector represented in the associated lower-level fragment.

28. The method of claim 27 wherein the hierarchy of bitmaps is used to select sectors to divide to provide values for assignment as identifiers or assigned values to be re-assigned.